



(19)

Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

EP 0 881 742 A3

(12)

EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
10.05.2000 Bulletin 2000/19(51) Int. Cl.⁷: H02K 1/16, H02K 3/12,
H02K 3/44, H02K 19/22,
H02K 3/487(43) Date of publication A2:
02.12.1998 Bulletin 1998/49

(21) Application number: 98109359.4

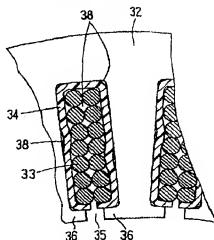
(22) Date of filing: 22.05.1998

(84) Designated Contracting States:
AT BE CH CY DE DK ES FR GB GR IE IT LI LU
MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI(30) Priority: 26.05.1997 WO PCT/JP97/01778
22.09.1997 WO PCT/JP97/03374
26.09.1997 JP 27975097
26.09.1997 JP 27975197
26.09.1997 JP 27975297
14.10.1997 JP 29788297
10.02.1998 JP 4439098(71) Applicant: Denso Corporation
Kariya-city, Aichi-pref., 448-8661 (JP)(72) Inventors:
• Umeda, Atsushi
Kariya-shi, Aichi-pref., 448-8661 (JP)
• Shiga, Tsutomu
Kariya-shi, Aichi-pref., 448-8661 (JP)
• Kusase, Shin
Kariya-shi, Aichi-pref., 448-8661 (JP)(74) Representative:
Winter, Brandt, Fürniss, Hübner, Röss,
Kaiser, Polte
Partnerschaft
Patent- und Rechtsanwaltskanzlei
Alois-Steinecker-Strasse 22
85354 Freising (DE)

(54) AC generator for vehicles

(57) An AC generator (1) for a vehicle including a rotor (2) with a fan, a stator (3) disposed around the outer periphery of the rotor (2), and a frame. The stator (3) includes a laminated core (32) having a plurality of slots (35), a plurality of electric conductors (33a, 33b) in the slots (35), and an insulator (34). There is a gap (38) between the electric conductors (33a, 33b) and the insulator (34) in a diametrical section of the slots (35), and an area ratio of the gap (38) with respect to the sectional area of the slots (35) is not more than 25%. A portion of the electric conductor positioned within the slot has a substantially rectangular shape along the shape of the slot.

FIG. 1A



EP 0 881 742 A3

European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 98 10 9359

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
D, Y	DE 38 03 752 A (HITACHI LTD) 25 August 1988 (1988-08-25) * column 4, line 15 - column 6, line 62; figures 1-9 *	1,4	H02K1/16 H02K3/12 H02K3/44 H02K19/22 H02K3/487
Y	US 1 822 261 A (APPLE V.G.) 8 September 1931 (1931-09-08) * page 2, right-hand column, line 70 - line 80; figures 2,7,8 *	1,4	
A	US 5 619 787 A (COUTURE PIERRE ET AL) 15 April 1997 (1997-04-15) * column 4, line 1 - line 41; figures 1-28 *	1,3,4	
A	US 4 829 206 A (HONSHIMA TERUHISA ET AL) 9 May 1989 (1989-05-09) * column 2, line 8 - column 3, line 2; figures 1-3 *	2	
A	EP 0 393 486 A (SIEMENS AG) 24 October 1990 (1990-10-24) * column 2, line 19 - column 4, line 57; figures 1-7 *	2,3	TECHNICAL FIELDS SEARCHED (Int.Cl.6) H02K
A	DE 34 33 450 A (BORRECK HERBERT) 20 March 1986 (1986-03-20) * figures 2-6 *	2,3	
A	DE 40 31 276 A (BOSCH GMBH ROBERT) 9 April 1992 (1992-04-09) * figures 1-7 *	1,4	
A	FR 2 584 246 A (ALSTHOM ATLANTIQUE) 2 January 1987 (1987-01-02) * figures 1-6 *	1,3,4	
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 9 March 2000	Examiner Tangocci, A
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons A : member of the same patent family, corresponding document			

EP 0 881 742 A3 (P.1/1)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 98 10 9359

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

09-03-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 3803752 A	25-08-1988	JP 63194543 A FR 2610770 A GB 2202170 A	11-08-1988 12-08-1988 21-09-1988
US 1822261 A	08-09-1931	NONE	
US 5619787 A	15-04-1997	US 5714824 A AT 171018 T AU 2404295 A BR 9507850 A CA 2186640 A WO 9600460 A CN 1150869 A DE 69504674 D DE 69504674 T EP 0766882 A JP 10507057 T	03-02-1998 15-09-1998 19-01-1996 16-09-1997 04-01-1996 04-01-1996 28-05-1997 15-10-1998 06-05-1999 09-04-1997 07-07-1998
US 4829206 A	09-05-1989	JP 1882996 C JP 6003979 B JP 62203527 A CA 1266295 A CN 1004183 B EP 0235597 A	10-11-1994 12-01-1994 08-09-1987 27-02-1990 10-05-1989 09-09-1987
EP 0393486 A	24-10-1990	DE 8904874 U DE 59004719 D	08-06-1989 07-04-1994
DE 3433450 A	20-03-1986	NONE	
DE 4031276 A	09-04-1992	DE 9017835 U WO 9206527 A	12-03-1992 16-04-1992
FR 2584246 A	02-01-1987	NONE	

EPC FORM 100a

For more details about this annex: see Official Journal of the European Patent Office, No. 12/82